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INDUCTIVE METHOD OF BATTERY CHARGING IN ELECTRIC VEHICLE

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Abstract: This project deals with inductive charging systems for Electric vehicles using wireless transmission whereas in conventional method Electric vehicles are charged manually through the Plug-In electric charger cables. This technology finds a great place in automotive sector especially in Electric Vehicles. The goal is to transmit power using resonance coupling and to build the charging systems.

Index Terms **– Electric vehicle, Inductive charging, wireless etc.**

I. INTRODUCTION

This project deals with inductive charging systems for Electric vehicles using wireless transmission. The main goal is to transmit power using resonance coupling and to build the charging systems. The system deals with an AC source, transmission coil, reception coil, converter and electric load which is battery. It Provides convenience to the customer, inherent electrical isolation, regulation done on grid side and reduce battery charging time. Whereas in the conventional system charging in the electric vehicle is done through the cables(Plug in system),which has comparatively more losses than the proposed one.

II. PROPOSED SYSTEM

In this system we charge the electric vehicle on roads by wireless charging method. The main objective of our project is to design and develop antenna and wireless power transfer system suitable for moving electric vehicles. Using resonant magnetic coupling principle, the wireless power transfer technology to the electric vehicle is designed. When the vehicle's power receiver's frequency is tuned in exact with the resonance frequency of the transmitter unit below the road, the electrical power will flow from the transmitter coil inside the platform to the receiving coil inside the bottom of the electric vehicle. This project describes the design and implementation of a wireless power transfer system for moving electric vehicles involving the model EV system.

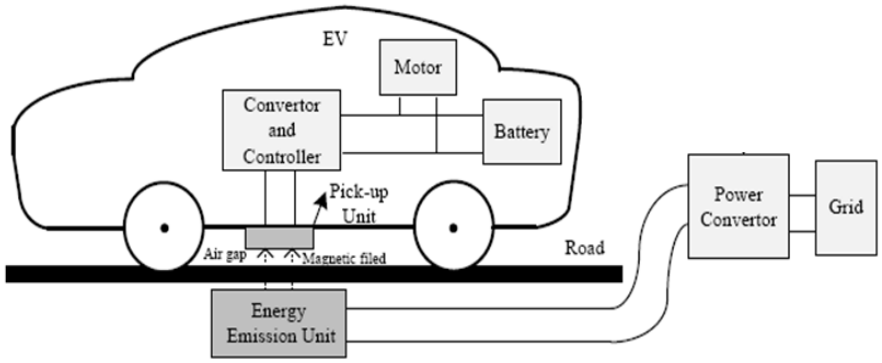


Figure 1 : Annimated Diagram of Proposed System

III. SIMPLIFIED BLOCK DIAGRAM OF PROPOSED SYSTEM

In an effort to address battery problems, the concept of roadway-powered electric vehicles has been proposed. With this system, the electric vehicle is charged on the road by wireless power charging, and the battery can hence be downsized and no waiting time for charging is needed. The main objective of our project is to design and develop antenna and wireless power transfer system suitable for moving electric vehicles (EVs). Using resonant magnetic coupling principle, the wireless power transfer technology to the electric vehicle is designed. When the vehicle's power receiver's frequency is tunedin exact with the resonance frequency of the transmitter unit below the road, the electrical power will flow from the transmitter coil inside the platform to the receiving coil inside the bottom of the electric vehicle. This project describes the design and implementation of a wireless power transfer system for moving electric vehicles involving the model EV system.

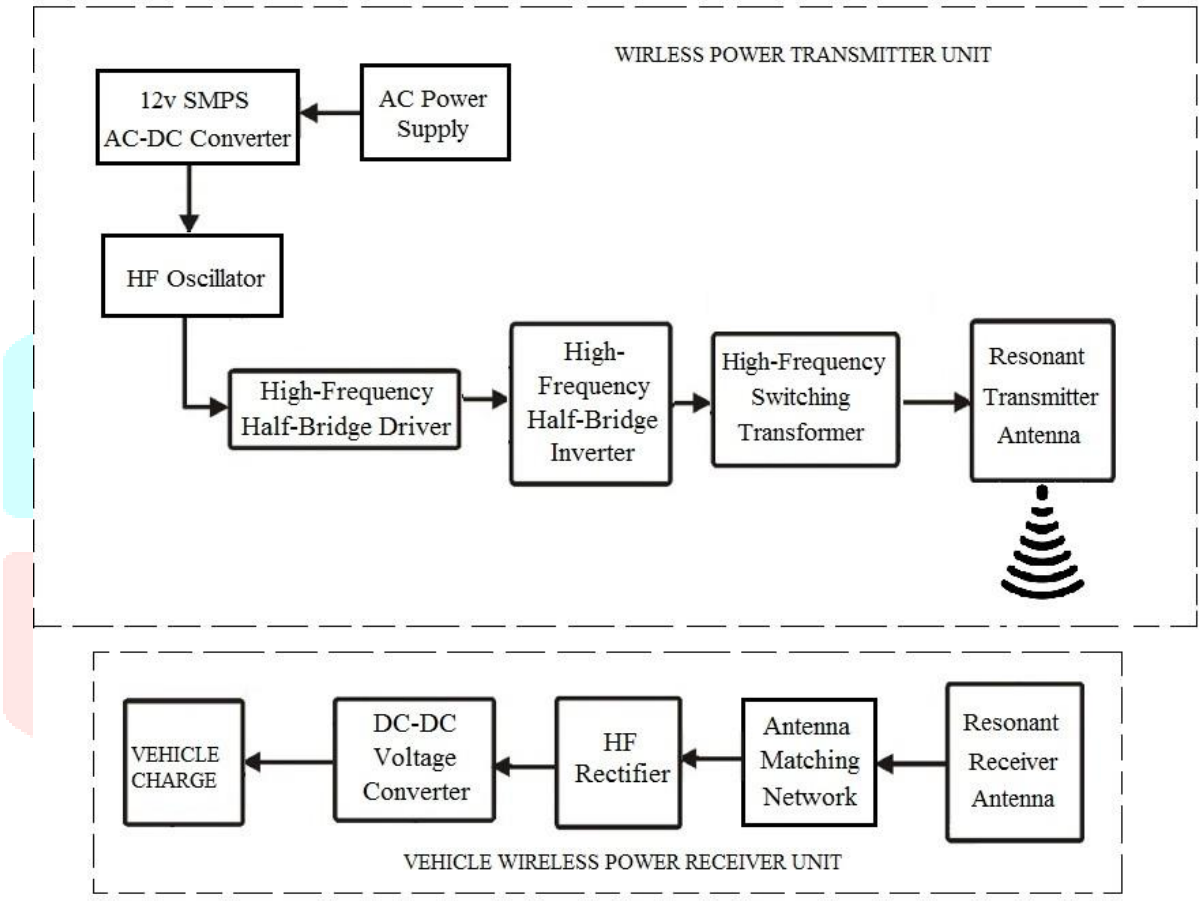


Figure 2 : Simplified Block Diagram Of Proposed System

IV. Simulation Circuit Diagram:

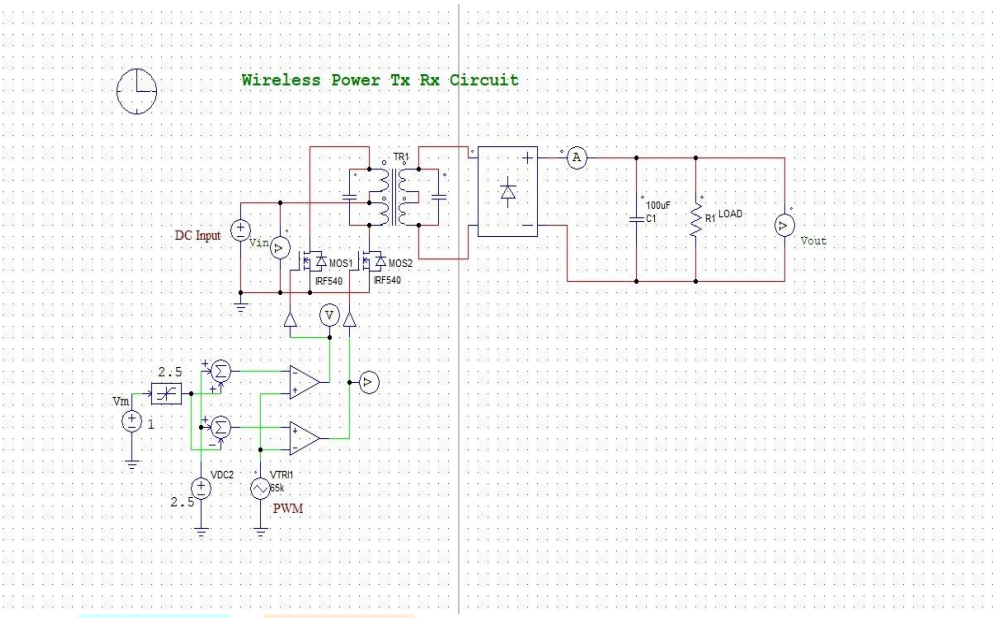


Figure:3: Simulation Circuit Diagram

- Anything connected to Axxon Intellect Enterprise (a camera, for example)is organized and represented as a virtual software object to the end user. Users don't have to worry about the type of device, how it's connected or where it's mounted they can control all devices the same way.
- Basic and advanced programming scripts and macros allow users to configure awide range of automated response actions.
- Unlimited time zones. System actions can be configured to occur at specific times orin case of specific security events. Weekday, weekend and holiday scheduling can be customized.
- Create a multi-level site map in .bmp format and label specific alarm devices. Automatically zoom to the appropriate map layer or object upon alarm. One-click access to real time video flow from any connected device.
- Easily view up to 1000 security events per day. Quick security event configuration via mouse click
- Configure a sound alert to follow specified security events. Requires sound board. Can be set up for single or dual speaker configuration.
- Users can group virtual software objects by area and type to enhance desktop organization and enable quick access

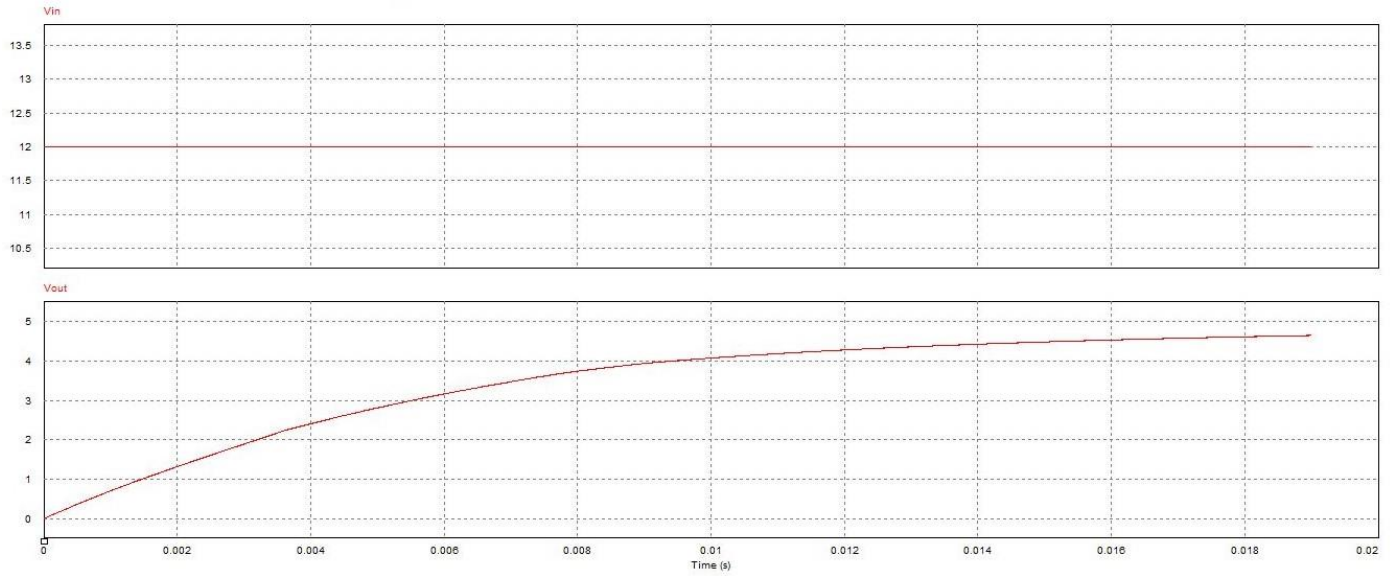
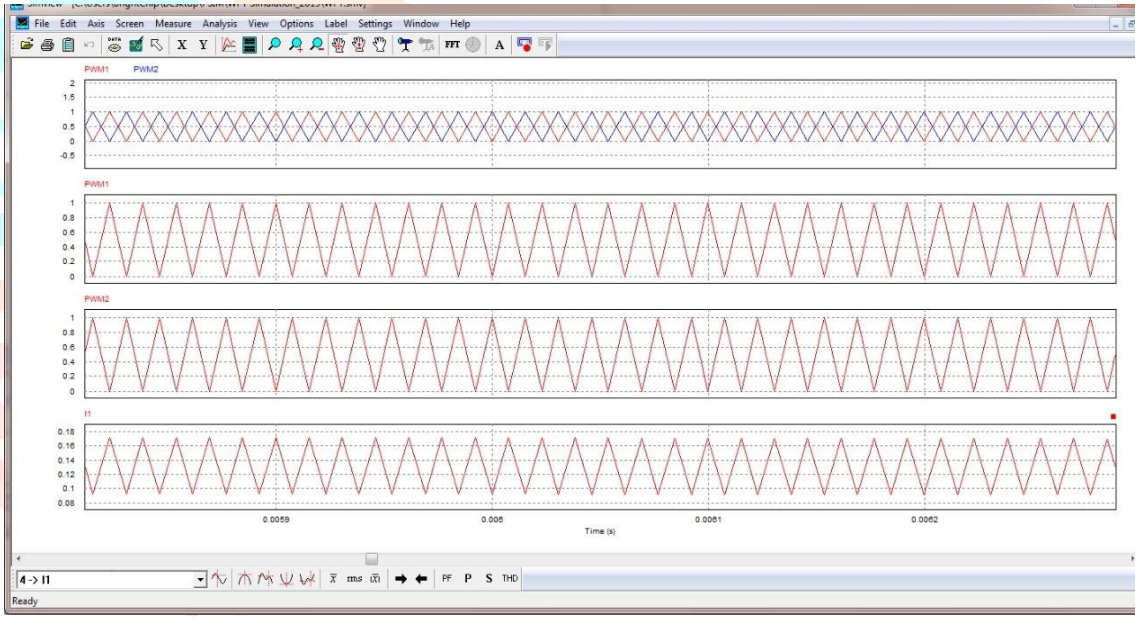


Figure 4: Input Voltage(Vin) & Output Voltage(Vout)



V. ADVANTAGES

No need of line of sight: In Wireless power transmission there is no any need of line of sight between transmitter and receiver. That is power transmission can be possible if there are any obstructions like wood, metal, or other devices were placed in between the transmitter and receiver, but in case of plug in system as we used cables as a physical connection. No need of power cables and batteries : Wireless power replaces the use of power cables and batteries, but in case of plug in system we require cables and batteries Negative health implications : By the use of resonant coupling wave lengths produced are far lower and thus make it harmless. Highly efficient than plug in conventional system as there are chances of shock . Resonant induction system is efficient than plug in system. Lesser cost : The components of transmitter and receivers are cheaper. So this system is less costly compared to conventional system

VI. LIMITATIONS

1. WPT (wireless power transmission) can be possible only in few meters. As Wireless power is in development stage, a lot of work is done for improving the efficiency and distance between transmitter and receiver.

2. Inefficient for longer distances.

3. One of the major problems in power system is the losses occurring during the transmission of electrical power

VII. Acknowledgment

It is our privilege to express a deep gratitude to everyone who has rendered valuable help in presenting this project work. Apart from the efforts, the success of any project depends largely on the encouragement and guidelines of many others. The guidance and support received from all the members who contributed and who are contributing to this project, was vital for the success of the project. I am grateful for their constant support and help.

VIII. Conclusion

In this project we have introduced a controller that can be used in Wireless EV charging systems to charge electric vehicles without wires. The proposed controller is capable of self-tuning the switching operations of the converter to the resonance frequency of the WPT system, and therefore eliminates the need for switching frequency tuning. Also, it enables soft-switching operations in the converter, which will result in a significant increase in the efficiency of the power electronic converter. Contactless electric vehicle (EV) charging based on inductive power transfer (IPT) systems is a new technology that brings more convenience and safety to the use of EVs. Since it eliminates the electrical contacts, it would not get affected by rain, snow, dust and dirt, it is a safe, reliable, robust and clean way of charging electric vehicles, reduces the risk of electric shock.

References

[1] A Review of Wireless Power Transfer for Electric Vehicles: Prospects to Enhance Sustainable Mobility: wireless power transfer, which transmits power by an electromagnetic field across an intervening space provides the prospect of new opportunities for electric vehicles to enhance sustainable mobility,16 March 2019.

[2] Wireless Power Transfer in Electric Vehicles: A detailed accumulation of the methods of wireless power transfer including short range as well as mid range transmission, 12 October 2018.

[3] Wireless Power Transfer for Electric Vehicle Applications: Wireless power transfer (WPT) using magnetic resonance is the technology which could set human free from the annoying wires,16 March 2018

[4] T. Blackwell, “Recent demonstrations of laser power beaming at DFRC and MSFC,” AIP Conference Proceeding, Beamed Energy Propulsion: Third International Symposium on Beam Energy Propulsion, vol. 766, pp.73-85,